

Unit 2 Test 2 Review - Quadratic Equations

1. When solving the equation $x^2 - 8x - 7 = 0$ by completing the square, which equation is a step in the process?

- a. $(x - 4)^2 = 9$
- b. $(x - 4)^2 = 23$
- c. $(x - 8)^2 = 9$
- d. $(x - 8)^2 = 23$

2. Solve the following system of equations:

$$y = x - 4$$

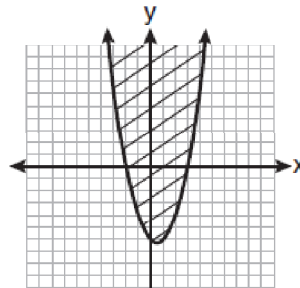
$$y = x^2$$

3. Find the missing value to complete the square.

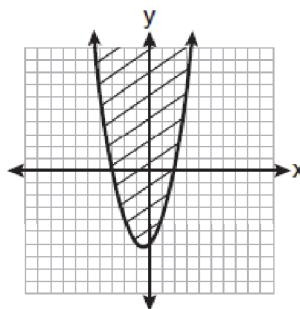
$$x^2 + 2x + \underline{\hspace{2cm}}$$

4. Find a quadratic function that has roots at 7 and -2 and the "a" value is 1. Write your final answer in standard form.

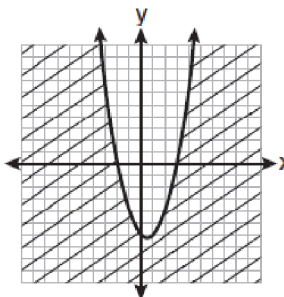
5. Which graph best represents the inequality $y + 6 \geq x^2 - x$?



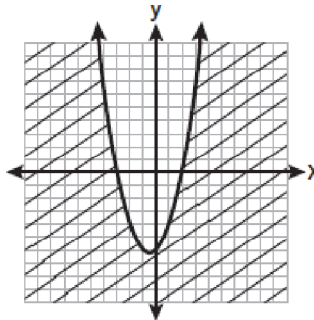
a.



b.



c.



d.

6. Solve the following system of equations for $y = x^2 - 6x + 9$ and $y = 4x - 12$

7. Fred's teacher gave the class the quadratic function $f(x) = 4x^2 + 16x + 9$.

a) State two different **methods** Fred could use to solve the equation $f(x) = 0$.

b) Using one of the methods stated in part a, solve the equation.

8. Find a rule for a quadratic function that has x -intercepts at $-2 \pm \sqrt{3}$ and has an a -value of -4 . Express the function in standard form.

9. Consider the quadratic function $f(x) = x^2 + 6x - 4$.
- a. Rewrite the function rule in vertex form.

b. Determine the coordinates of the maximum or minimum point of the graph of this function.

c. Solve the equation $x^2 + 6x - 4 = 0$.

10. State the discriminant for each equation. How many solutions (and what type) do each of the following functions have?

a. $x^2 - 6x + 11 = 2$

b. $x^2 + x + 1 = 0$

c. $3x^2 + 5x = 12$

Solve:

11. Where does the graph of $x^2 - 6x + 8$ cross the x-axis?
12. In the function $f(x) = (x - 2)^2 + 4$, the minimum value occurs when x is what?
13. Find the zeros of the function $f(x) = 2x^2 - 4x - 6$

14.

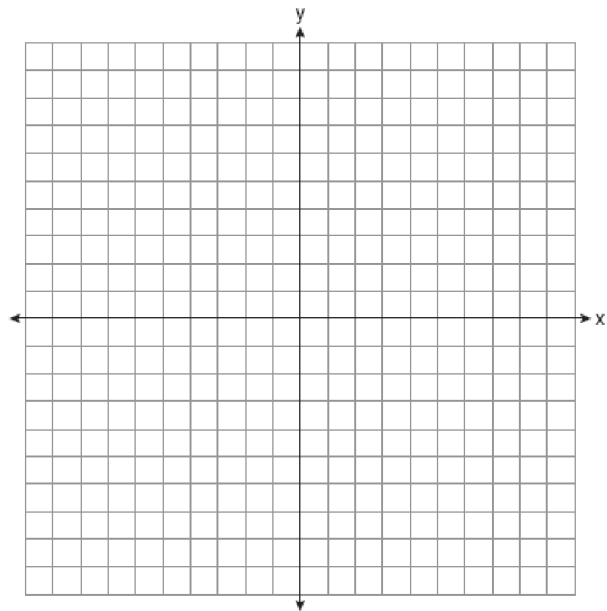
Algebraically determine the values of x that satisfy the system of equations below. Then, accurately **graph** the system of equations, showing clear solutions, on the coordinate plane provided below. What would it look like if it had no real number solutions?

$$y = -2x + 1$$

$$y = -2x^2 + 3x + 1$$

Algebraically:

Graphically:



Name: _____

ID: A

15. Solve the following quadratic equations using the given method.

a. $x^2 + 9x + 38 = 13$
(Completing the Square)

b. $5x^2 - 7x + 13 = 10$
(Quadratic Formula)

c. $8x^2 - 30x + 25 = 0$
(Factoring)

d. $x^2 - 64 = 0$
(Factoring)

e. $x^2 + 64 = 0$

Solve the quadratic equation.

16. $-3x^2 + 7x = -5$

17. Solve the equation $x^2 - 12x = -40$

Unit 2 Test 2 Review - Quadratic Equations Answer Section

1. ANS: B TOP: Solving Quadratics KEY: completing the square

2. ANS:

3. ANS:

1

DIF: L2 STA: NC A2.1.02 | NC A2.2.02

TOP: 5-7 Example 2

KEY: completing the square

4. ANS:

y=

5. ANS: A

TOP: Quadratic Inequalities

KEY: two variables

6. ANS:

$$y^{x^2} - 6x + 9 = 4x - 12$$

$$x^2 - 10x + 21 = 0$$

$$(x - 7)(x - 3) = 0$$

$$x = 7, 3$$

TOP: Solving Quadratics

KEY: factoring

7. ANS:

Two of the following: quadratic formula, complete the square, factor by grouping or graphically.

$$x = \frac{-16 \pm \sqrt{16^2 - 4(4)(9)}}{2(4)} = \frac{-16 \pm \sqrt{112}}{8} \approx -0.7, -3.3$$

TOP: Solving Quadratics

KEY: quadratic formula

8. ANS:

a

STA: IMI.1.g | IMI.1.i | IMI.1.j | IMI.3.p | IMIII.1.b | IMIII.1.f

9. ANS:

a. $f(x) = x^2 + 6x + 9 - 4 - 9$

$$f(x) = (x + 3)^2 - 13$$

b. The minimum point has coordinates $(-3, -13)$.

c. $x = \frac{-6}{2(1)} \pm \frac{\sqrt{6^2 - 4(1)(-4)}}{2(1)} = \frac{-6}{2} \pm \frac{\sqrt{52}}{2} = -3 \pm \sqrt{13}$

STA: 2.02b | 2.02a

10. ANS:
 a. one solution
 b. two imaginary
 c. two real solutions

11. ANS:
 $(x - 2)(x - 4)$

DIF: L2 TOP: 5-4 Example 3
 KEY: factor a quadratic expression | quadratic expression

12. ANS:
 2

TOP: Vertex Form of a Quadratic

13. ANS:
 3 and -1

TOP: Solving Quadratics KEY: zeros of polynomials

14. ANS:
 $-2x + 1 = -2x^2 + 3x + 1$

$$2x^2 - 5x = 0$$

$$x(2x - 5) = 0$$

$$x = 0, \frac{5}{2}$$

TOP: Quadratic-Linear Systems

15. ANS:
 a. $x^2 - 64$
 b. $2x^2 + 13x + 21$
 c. $x^2 + 6x + 9$
 d. $x^2 + 7x - 44$

STA: IMI.1.i | IMI.1.j | IMI.2.a

16. ANS:
 $\frac{7}{6} \pm \frac{\sqrt{109}}{6}$

DIF: L2 STA: NC A2.1.02 | NC A2.2.02 TOP: 5-7 Example 5
 KEY: quadratic equation

17. ANS:
 $6 \pm 2i$

TOP: Solving Quadratics KEY: completing the square